

MANUFACTURING EXTENSION PARTNERSHIP

Success Stories from the Field

Clean Earth Technologies

Missouri Enterprise

Clean Earth Technologies, LLC, Designs for the Future

Client Profile:

Clean Earth Technologies, LLC (CET), a privately-held company, was founded in 1996 by Dr. Jeff Golden and Bob Morgan. CET is headquartered in an 18,000 square foot facility in St. Louis, Missouri. This facility includes 6,000 square feet of research, development, testing and evaluation lab space. CET also has a 5,000 square foot facility in Dallas, Texas, where it conducts state-of-the art research and development on military C4I and imaging systems. The company's facilities are outfitted with design, fabrication, test and evaluation assets, both hardware and software, that allow CET to rapidly respond to its customers needs. In addition to research and technology development, CET can work closely with customers to identify requirements and produce standards and/or protocols, facilitate user workshops and training sessions, and to write technology assessments, training, doctrine and policy and planning strategy documents. CET has a seasoned, successful management staff that has led the company to 66 percent annualized growth since 1998. The multi-disciplinary technical team is lead by an experienced group whose backgrounds include work in national labs, academia and fortune 500 technology firms. For the past several years, CET's principal focus has been on development of technologies for the defense, intelligence, sensors, datalinks and life science sectors. CET has broad experience in optics, photonics, fast-frame imaging, sensors, remote sensing, directed energy technology, decontamination/disinfection/sterilization technology and diagnostics. CET's Earth City, Missouri, facility employs 12 people.

Situation:

CET had numerous projects requiring detail design challenges and assistance. Due to an already substantial internal work load, there was a shortage of resources available to develop existing concepts into workable designs. These designs were required for securing additional funding and presentations to existing partners and prototypes / test equipment. CET contacted Missouri Enterprise, a NIST MEP network affiliate, for assistance with Decontamination Equipment Design, the Drive Through Decontamination System, and the Video Housing Design.

Solution:

One of the main thrusts of CET's research and development has been in the area of personal decontamination systems. Missouri Enterprise was asked to design the handheld housing that contained several of the major components of one of these systems. The detailed design was done using Pro Engineer software. The design incorporated switches, wiring and cooling fans, along with CET's proprietary devices, into a piece of equipment that had to be both ergonomically sound and operable in adverse conditions. The design had to incorporate quick and easy disassembly for repairs for repairs and utilization by operators wearing gloves. A set of drawings for use by anticipated mold makers was delivered along with a complete set of solid models. In addition to these items, Missouri Enterprise worked closely with a rapid prototyping company to provide CET with models of the design

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for use in design analysis and testing.

The Drive Through Decontamination System is another decontamination system being developed by CET for vehicles or large moveable equipment. Missouri Enterprise was brought in early on this project to assist in the conceptual layout of the system's appearance. Using Pro Engineer software, a layout was constructed. Working closely with CET, the basic design idea of the system was documented and entered into the computer. For this project, a vehicle needed to be modeled along with the support equipment that is anticipated for such a system. Various views were documented and provided for review. The views created were used for proposals and internal conceptual development. The Decontamination System Illustration was a follow-up to the above system design. Although models of the system had been created using CAD solid modeling software, the limitations of the software prevented creation of photo realistic illustrations. CET was anxious to have illustrations that show the system in a photo realistic manner. Missouri Enterprise created still illustrations using 3D Studio Max modeling software. The modeling was based on the existing CAD solid model and included: modeling of the site and surroundings, high-resolution photo realistic modeling of vehicles, all support structures and architecture, supporting equipment (pumps, tanks and control panels, etc.). Details like lighting, including shadowing, reflections, caustics and atmospheric conditions, as well as special effects, were included.

CET was developing a proprietary video system which needed a housing for protection. Due to the timing of the project and the workload of CET employees, Missouri Enterprise was asked to do the design. Missouri Enterprise provided CAD assistance on the design of the housing system which was comprised of a base, lens support, cover, interface plate(s) and screens. This work was done under the direct supervision of CET and completed using Pro Engineer software. A set of drawings for use by machine shops and anticipated mold makers was delivered along with a complete set of solid models. In addition to these items, Missouri Enterprise worked closely with rapid prototyping companies to provide CET with models of the design for use in design analysis and testing.

Results:

- * Very satisfied with work provided by Missouri Enterprise.
- * Projected sales of \$8 million for next decade, a return on investment of \$309 for every dollar spent.

Testimonial:

"Missouri Enterprise provided a rapid response to our needs. Their staff generated designs using sound engineering principles. The resulting prototypes were well received at trade shows and served to maintain our company's level of excellence. Missouri Enterprise's staff was highly professional at all times. We would not hesitate to use them as a resource in the future."

Dr. Chris Kocker, Senior Mechanical Engineer